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AUTHOR	Lynch, William W.; Ames, Carole
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ABSTRACT

This study was designed to identify stable and meaningful aspects of teaching behavior pertaining to the individualization of instruction in special classes for the retarded. Ten predominantly urban classes for intermediate educable mentally retarded pupils were selected from the total of 32 such classes in a large city. These classes were observed throughout an entire school year to record the instructional interchanges between the teachers and individual children. Using the nine-category Individual Cognitive Demand Schedule (ICDS), developed for this project by the authors, a record was made for each instructional interchange of (1) the pupil involved in the interchange, (2) the principal type of level of cognitive activity called for, and (3) the type of teacher feedback given to the child's response. The teachers manifested distinctive types of individualization in their distributions of instructional communications across various kinds of cognitive activity and in the use they made of feedback. Individualizing behavior apperas to be affected by the teacher's rate of interchange, the distribution of interchanges across children in the class, and to some extent, the are of the curriculum being taught. (Author/RT)

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Differences Among Special Class Teachers in Individualization of Instruction

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William W. Lynch

Carole Ames

Indiana University

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Differences Among Special Class Teachers

in Individualization of Instruction

William W. Lynch

Carole Ames

Indiana University

This study describes behaviors pertaining to the individualization of instruction observed in a sample of teachers of educable mentally retarded children during one school year. It is a part of a larger investigation on the effects of selected teacher characteristics, pupil characteristics, situational, and teacher-training variables on the individualizing behavior of teachers. A number of theories of instruction and conceptions of special education picture the ideal teacher as an adept diagnostician and instructional tactician who is capable of readily adapting daily instruction to the unique characteristics of individual pupils. On the other hand, the Rosenthal expectancy hypothesis, person perception research, and studies of the behavioral ecology of the classroom cast doubt on the ability of the teacher to individualize instruction. The data reported here represent an initial attempt to discover and describe what "individualization of instruction" may mean under the conditions of the typical urban classroom for intellectually handicapped children who have been placed in a special class presumably so that they can experience instruction that is adapted to their needs and abilities.

Assuming that a significant aspect of individualized instruction is the type of instructional communication that is directed by the teacher to individual pupils, the study attempted to define stable and meaningful indices of "style" of individualization, seeking answers to the following questions:

1. How do teachers vary in the frequency of personalized opportunities they provide for each pupil to engage in any kind of directed cognitive activity?
2. How much variation is there among teachers in the relative frequencies of different levels of cognitive activity and instructional feedback provided for individual pupils?
3. How does teacher style of individualization vary across the principal areas of the special-class curriculum?
4. Is there a relationship between the kinds of cognitive demands made on individual pupils and the types of teacher feedback given?

Thirteen classes of intermediate educable mentally retarded children ages, nine to thirteen, in a large city school system were observed periodically over an entire school year. Each instructional interchange between teacher and an individual pupil was recorded and classified according to the principal cognitive demand character of the interchange and the kind of feedback provided by the teacher.

Instrument.

The principal instrument for the study was the Individual Cognitive Demand Schedule (ICDS), developed for this project by the authors. Each time the teacher interacts verbally with an individual child for purposes of instruction a record is made on the ICDS of (1) the pupil involved in the interchange, (2) the principal type of cognitive activity created by the teacher for the pupil, and (3) the type of feedback given by the teacher to the child's response. Nine categories, hierarchically ordered, describe the principal cognitive demands of instructional interchanges. Teacher feedback was classified into seven categories representing various forms of affective and informative feedback. The ICDS also provides a record

of the area of the curriculum being taught at the time of observation and the frequency of interchanges per five-minute interval.

The categories of the ICDS are briefly defined as follows:

Cognitive Demand Categories

1. Routine responding. An activity requiring only a simple, habitual, virtually automatic response with minimal requirements for information processing, memory or decision making.
2. Discriminating-observing. Noticing and identifying stimuli or cues present to the senses.
3. Chaining. Making direct, already-learned sequential responses to a sequence of cues. The most common example is simple reading aloud of relatively easy reading material.
4. Informing - recalling. Remembering something and reporting on it. Usually the child is recalling something he has just experienced.
5. Explaining. Relating selected pieces of information in a situation to one another or to principles or rules already known by the child.
6. Classifying. Relating characteristics or attributes of objects or events to more general categories, concepts, or classes, and labeling the category.
7. Inferring. Calling upon the child to arrive at his own conclusion, deduction or interpretation from available information.
8. Evaluating - judging. The child compares an instance with an explicit or implicit standard.
9. Problem solving. Confronting the child with a perplexing situation in such a manner that he must both analyze the situation and construct a solution or answer.

Feedback Categories

1. Positive Feedback. Indicates to the child that his response was adequate, acceptable or correct, involving little or no communication of feeling.

   Examples: Yes, Correct, Right, OK, repeating the child's response, writing the child's answer on the board indicating to him that it is correct.

2. Negative Feedback. The teacher indicates to the child that his response is inadequate or incorrect with a minimal communication of feeling.

   Examples: No, there's more to it than that. Not really.

3. Question. The teacher asks the child to clarify, elaborate, or qualify his response.

   Example: Tell me more about it. How do you know? Why do you say that?

4. Clarify. Expanding on a child's response, adding information, clarifying a point, or explaining why a response was or was not acceptable.

5. Praise. Verbal reinforcement accompanied by expressions of positive feelings. The effect of the communication is to elicit similar (positive) feelings in the child, i.e., to make the child feel good.

   Examples: Fine, Good, Very Good, Wonderful

6. Chide. Suggests to the child that his response was inadequate for some personal reason (lack of effort, inattention, incorrect procedure), often involving the use of personal criticism. The teacher communicates a feeling of disappointment or anger with

the intention or effect of eliciting negative feelings in the child.

Examples: You aren't paying attention. How could you know when you aren't looking at the board.

7. No Feedback. "No feedback" is recorded when the teacher disregards or does not attend to individual responses in an interchange.

The interobserver reliability of the ICDS has been estimated by having three comparably trained observers independently categorize a tapescript of a two-hour recording of an intermediate EMR class taught by a teacher who was sufficiently versatile to use every kind of cognitive demand represented in the instrument. Most of the kinds of instructional activities were included that were found in the observation sample of this study. The percentages of agreements were: observer A and observer B - 78%; observer A and observer C - 82%; observer B and observer C - 81%.

The stability of the teachers in their relative frequencies of use of the cognitive demand categories over the school year was examined by computing correlation of coeficients between odd and even numbered interchanges for each cognitive demand category and correcting by the Spearman-Brown formula. The mean corrected correlation was .99 (range .98 - .99).

Dividing the school year's observation periods into sixths and intercorrelating sixths yields a less optimistic picture of stability with correlations ranging from -.49 to .89. Since subsequent analysis showed that kinds and levels of cognitive demands are dependent upon instructional activity and since the sampling of instructional activities was not constant across extracted sixths, the range of correlations reflects the uneven sampling of activities across sixths.

Sample.

Thirteen intermediate classes for the educable mentally retarded taught by teachers with at least one year of experience were selected from the total of 32 such classes in a large city (population 740,000) school system. In the judgement of the Director of Special Education of this system these classes were representative of the principal types of school districts in the city that had special classes. They were predominantly in lower-class districts. Eight of the thirteen classes were in schools with predominantly Black pupil populations. Statistically the teachers did not differ significantly from the total population of intermediate special class teachers in this city with respect to age, training, or length of experience.

Procedure.

The classes were observed by the authors (usually singly) in two to three hour blocks of time for an average of 1.5 hours each week that school was in session from the last week of September, 1969, until the end of the school year in June, 1970.

Teachers were informed at the beginning of the year that the study was a general, observational, non-evaluative investigation of pupil differences and the problems of instruction in special classes. They were told that the data were sought to guide development projects to prepare more effective methods of preparing teachers for this type of group. The teachers knew that during each observation period an observer would be recording the activity of each child as he was engaged in instruction by the teacher. Observers could be expected during any period of the school day during which instruction was normally planned. Teachers did not know in advance when an observer would be coming.

Each teacher was interviewed for data pertaining to the larger investigation in September and again in January. At these interviews as well as at each visit to the class the investigators sought evidence as to whether the observer's presence was a source of stress to the teacher or children. Teachers were repeatedly reminded that the observers would absent themselves at any time that the teacher wished. With two exceptions the teachers and children appeared to accept the presence of an observer and to manifest normal classroom behavior. The exceptions were two teachers who, by January, had shown signs of stress at having an observer present and, for other reasons cited below, were dropped from this study.

A preliminary analysis in February of the data gathered by that time indicated that, despite efforts to limit observation periods to times scheduled for formal instruction, the mean percentage of actual time observed that had been actually devoted to instruction was only 51 percent. Three classes contributed disproportionately to this low yield of observations and it was decided to drop these classes from the sample. (These three classes included those of the two teachers who appeared uncomfortable with observers.) The principal reason for this decision was that, with only two observers available, a limited time period, and warranted concerns about the stability of the data up to that date, it would be better to concentrate on the remaining ten classes for the remainder of the year. (The characteristics of the teachers of the remaining ten classes did not differ significantly from the total population of such teachers in the system.) By the end of the school year the ten remaining classes had maintained 67 percent of actual instruction during the times observed over the entire school year. (Range: 59 - 89 percent).

Results.

The ten classes remaining in the study yielded a total of 4,841 instructional interchanges for the time sampled during the school year. The class with the smallest number of interchanges had 253; the highest frequency was 825. These differences reflect differences in the rate at which the teachers interacted with individual pupils rather than differences in amount of time observed or the amount of instructional time. The differences between teachers in rate of instructional interaction were so marked that it became necessary to vary the amount of observation considerably. This resulted in a large range of actual instructional time observed (11.5 hours to 21.3 hours). Even with this large a range the correlation between amount of instructional time and total number of interchanges remains an insignificant .10. Rates of interchanges per hour computed for the year's sample range from 18 interchanges per hour to 61 interchanges per hour (mean: 41).

Variations Among Teachers in Distributions of Instructional Interchanges Across Pupils.

One measure of how teachers in the sample individualized instruction by directing instructional communications to individual pupils is the sheer frequency of such interchanges per child. (All statistics pertaining to the interchanges per child omit those children who were not enrolled for the entire school year or who were frequently absent.) The mean number of interchanges per pupil and the standard deviations in raw frequencies and in percentages of all interchanges per class are shown in Table 1. Since the number of instructional interchanges per child is a function of the teacher's overall rate of interacting with pupils, the percentages give a clearer comparative picture of the extent to which the

cognitive demands of any kind are distributed evenly across all pupils. Note that in the class with the most uneven distribution of cognitive demands the range is from one child who received two percent of all interchanges in the periods sampled to another child who received 22 percent of all interchanges.

Insert Table 1 about here

Figures 1 and 2 illustrate two quite different profiles of interchanges per child for the year. Teacher #9 allocates interchanges more equally than Teacher #2. These profiles should be interpreted in relation to the fact that teachers differed in the overall rate at which they interacted with individuals. A child receiving a low percentage of his teacher's interchanges may still be able to participate quite often if his teacher maintains a high rate of interchanges. For Teacher #2 the child receiving the lowest rate only has one interchange every two hours; the highest rate is four per hour. Teacher #9's range is two per hour to 6.5 per hour.

Insert Figures 1 & 2 about here

Distribution of Cognitive Demands

As teachers of special classes call on or interact with different children, do they vary the level of cognitive activity in which children may engage? In the first place the evidence from this sample of teachers suggests that there are rather sizeable differences among teachers in their overall distribution of questions and other communications across various kinds of cognitive activity. The differences are illustrated in Figure 3

Table 1

Distributions of Instructional Interchanges Among Pupils in Ten Classes.

Raw Frequencies				Percentages (Percent of Total Interactions Per Class)			
Teacher	Rate (Interactions Per Hour)	Mean Interactions Per Child	σ	Mean Interactions Per Child	σ	Range	Median Interactions Per Child
1	58	55	15.2	7.1	2.0	3.0 - 10.9	6.5
2	34	27	22.0	6.7	5.4	1.5 - 21.1	5.1
3	61	43	22.8	7.1	3.7	1.4 - 12.7	6.2
4	47	48	19.5	10.0	4.1	2.8 - 13.9	10.0
5	61	36	20.0	6.7	3.7	0.7 - 15.2	5.7
6	26	17	4.6	7.1	1.9	2.8 - 9.5	6.3
7	18	21	16.7	8.3	6.5	2.0 - 22.1	5.4
8	30	33	19.1	7.1	4.1	1.2 - 16.3	9.1
9	46	35	17.0	9.1	4.5	3.3 - 13.6	6.2
10	34	18	9.2	7.7	4.0	1.1 - 11.9	6.3

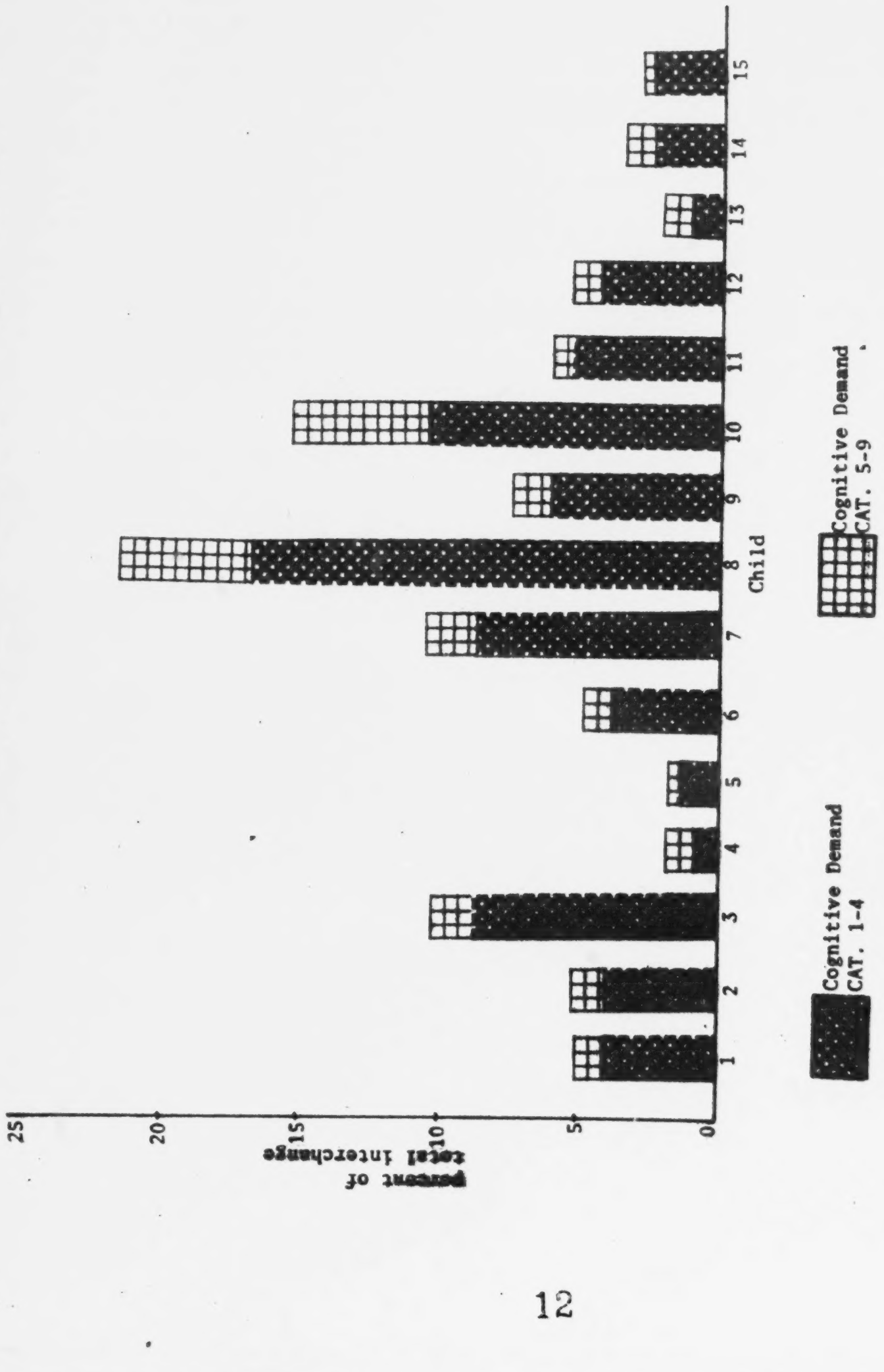

Fig. 1 Teacher 2 - Distribution of Interchanges across Pupils

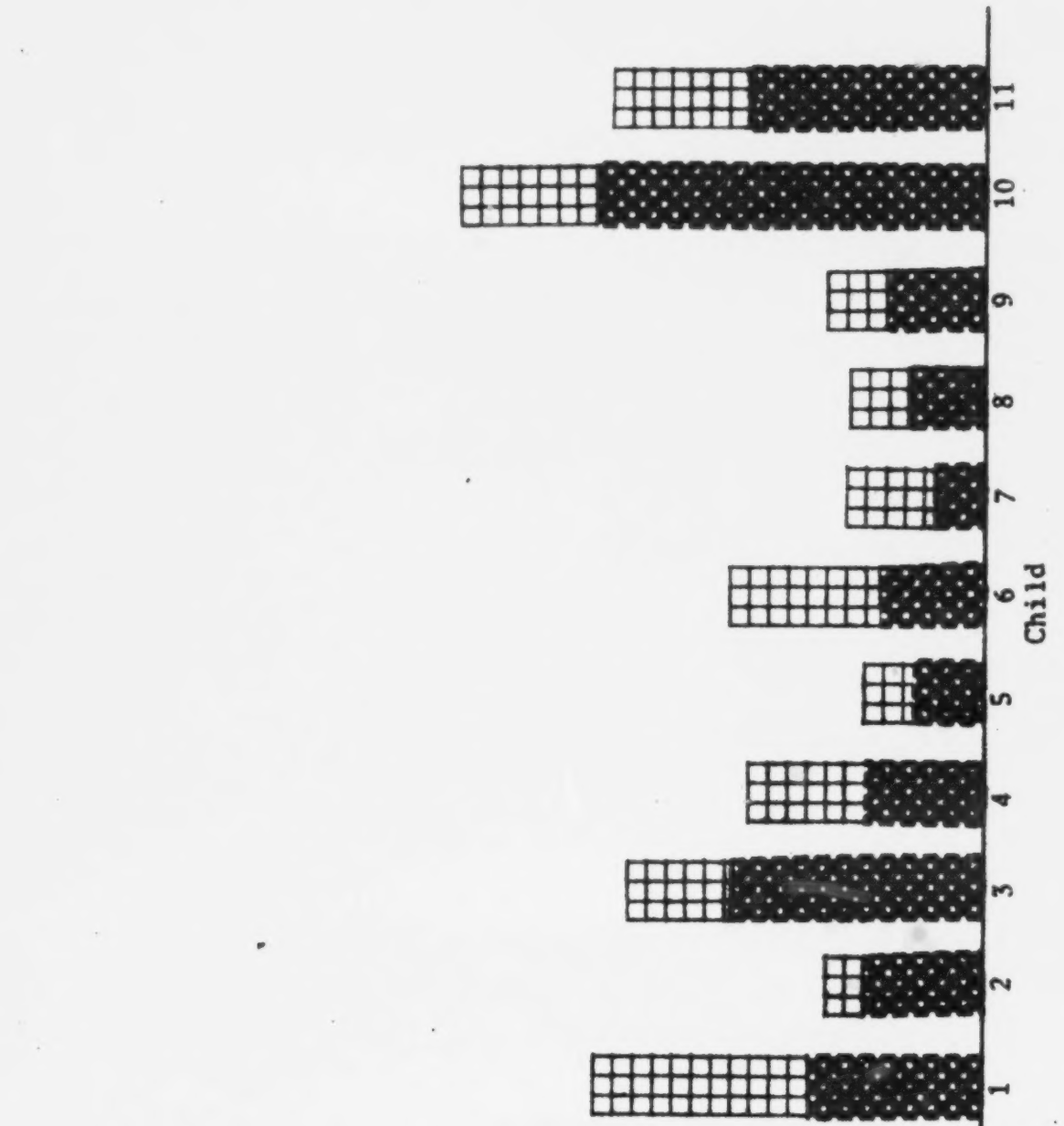

Fig. 2 Teacher 9 - Distribution of Interchanges across Pupils

which shows the distribution for the year's sample of their cognitive demands across the nine categories. If one considers that categories 1-4 represent rather low levels of cognitive activity (in the sense that they all simply require the child to deal with immediate cues and simple recall, with no emphasis upon mediation, transformation, or reasoning), then it is apparent that the general level of these classes is quite low. Figures 1 and 2 also illustrate some contrasts between teachers. Teacher #2, who uses higher level cognitive demands only 25 percent of the time allocates 43 percent of these to child 8 and child 10 (who, between them, receive 36 percent of all instructional interchanges). On the other hand Teacher #9 (Figure 2) who shows the highest frequency of use of categories 5-9 of the sample appears to distribute these rather equally across all members of the class.

Insert Figure 3 about here

Table 2 presents the breakdown of interchanges between categories 1-4 and 5-9 for each teacher. In addition to showing the relative frequencies in percent, the table shows the extent to which each teacher's use of the high-order cognitive categories is concentrated on a few pupils by showing the proportion of pupils in the class who are involved in three-fourths of all of the teacher's 5-9 interchanges.

Insert Table 2 about here

Note that teachers 3 and 9 differ quite markedly from the other eight teachers in their more extensive use of higher levels of cognitive demand. (In both cases 41 percent of their interchanges fall in categories 5-9.) Teacher 9 shows a more pronounced tendency to involve all pupils in the

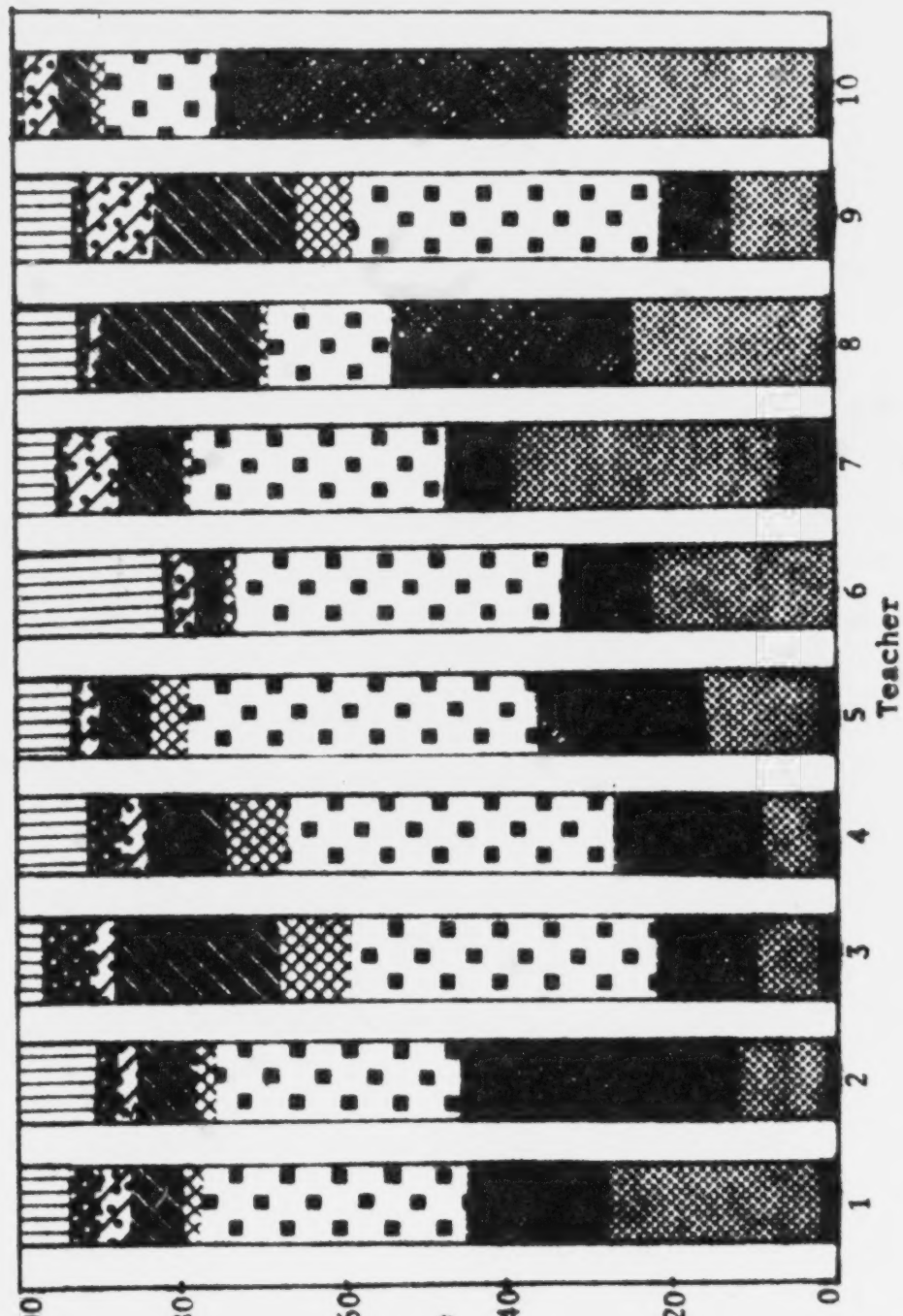

Fig. 3 Distribution of Cognitive Demands across 10 Teachers

Table 2

Teacher Distributions of Cognitive Demands

(Percent of Total Interchanges per Teacher)

Teacher	Categories 1-4	Categories 5-9	Percent of Pupils Receiving 75% of Cat. 5-9
1	79	21	57
2	75	25	53
3	59	41	57
4	70	30	50
5	79	21	57
6	72	28	57
7	78	22	36
8	71	29	57
9	59	41	64
10	89	11	42

opportunity to engage in higher levels of cognitive activity. Teacher 7, who focuses most of his rather limited use of the higher level categories to the smallest proportion of pupils, concentrated about three fourths of his higher level interchanges on five pupils, with another 5 pupils receiving three or fewer interchanges at these levels during the times sampled throughout the year.

Differences Between Curriculum Areas.

The distribution of cognitive demands within curriculum areas was examined by dividing instructional activities into six groups: reading, arithmetic, language arts (spelling, writing, grammar, et al.), social studies, science, and a miscellaneous group (newspaper, health, instructional games, seat work in which each child works on an activity of his own choice, et al.). The percentage of total interchanges sampled for the year falling in each curriculum area and the distribution of cognitive demands across each curriculum area are shown in Table 3. Reading activities represent the largest percentage of instructional interchanges (42%) and involve the smallest proportion of higher level cognitive demands (.20). In contrast, language arts constitutes only 17% of the total interchanges but shows the highest proportion of higher cognitive demands (.37). It was not feasible to sample comparable sizes of interchange data across curriculum areas, because in many classes, relatively small amounts of time were spent in some activities and the rate of interchange was often too low. Attempts to obtain equal samples of interchange data across curriculum areas would have yielded smaller amounts of data than were actually obtained and data of questionable reliability for those activities which have a high rate of interchange.

Insert Table 3 about here

Table 3

Distribution of Cognitive Demands by Curriculum Areas

Curriculum Area	Percent of Total Interchanges	Percentage Distribution Within Curriculum Area*					
		Discrim.-Observe	Chain	Inform	Explain	Classify	Cat. 7-9
Reading	42	25	25	29	3	9	8
Arithmetic	14	6	5	57	2	1	28
Language	17	20	21	19	5	19	13
Social Studies	8	2	19	48	10	11	9
Science	9	16	12	37	5	20	7
Miscellaneous	9	22	13	36	5	6	17

* Omitting Category 1 (Routine Responding) and pooling Categories 7, 8, and 9 (Inferring, Evaluating, and Problem Solving)

The data show large variations in the sampling of curriculum areas across teachers. Teacher #1 produced 78% of his interchanges in reading and none in language arts, social studies or science. Teacher #4 produced 60% of his interchanges in the latter three areas and no interchanges in reading. Classes were observed during morning and afternoon sessions, although in some cases it was necessary to eliminate one or the other because of the high frequency of activities occurring outside the classroom (art, gym, music) during a given portion of the school day. Consequently, the large differences found between teachers in their distributions of interchanges across activities is probably more representative of the naturally occurring proportions than would have been the case with equal sampling of interchanges across curriculum areas.

Chi square was applied to the frequency of interchanges in cognitive demand categories 1-4 and 5-9 for each teacher compared to the mean of the entire sample of teachers. Chi square values were computed for each curriculum area taught by each teacher, excluding low frequency areas of doubtful reliability. 25 comparisons were made. Of these 13 were significant at the .05 level. In reading, the most frequently occurring activity across teachers, six of the nine chi square values are significant. This suggests that the cognitive level of instruction within a classroom (controlling for curriculum area) cannot be easily predicted by summing data across teachers but is perhaps more related to an individual teaching style.

By comparing the distributions of cognitive demands across curriculum areas in teacher profiles, it again appears that the distribution of cognitive demands is dependent upon the individual teacher. Table 4 shows the distribution of cognitive demands in reading and language arts for teachers #3 and #7.

Insert Table 4 about here

Some idea of differences in the styles used by individual teachers in particular areas of the curriculum may be had by examining (1) the proportions of higher and lower cognitive demands used and (2) the tendency to favor a small number of cognitive demands. Comparing Teachers #3 and #7 in this fashion we can see that Teacher #3 not only makes higher level cognitive demands in both curriculum areas, but also, by utilizing a greater variety of cognitive demands in both areas, is less restrictive than Teacher #7. At the same time it would appear that the curriculum area affects both teachers' use of higher cognitive demands and their restrictiveness since language arts yields high levels of cognitive demand and less restrictiveness for each teacher.

Teacher Feedback

Is the type of feedback given to pupil responses by the teacher a distinguishing feature of the teacher's individualizing behavior? Relative frequencies of the use of the seven kinds of feedback by the teachers are shown in Figure 4. The general pattern of feedback in relation to types of cognitive demand is shown in Table 5. Positive feedback is the most common type, occurring almost 50 percent of the time and varying from 38 to 54 percent for the nine types of cognitive demand. No feedback of any kind occurred in 22 percent of the interchanges. "Praise" and "Chide," considered to be affect-producing feedback, occurred very infrequently. (On the other hand, a related study with the same sample revealed that affect-producing feedback is the rule rather than the exception when teacher communication with individual children in non-instructional interaction is examined.) The most cognitively informative types of feedback, "Question"

Table 4

Percentage Distribution of Cognitive Demands in Reading and Language for Teachers #3 and #7

Cognitive Demand Cat.	Teacher 3		Teacher 7	
	Reading	Language	Reading	Language
1	1	1	0	0
2	15	4	42	28
3	14	13	20	6
4	41	16	26	35
5	6	17	1	0
6	18	29	1	12
7	4	3	6	17
8	1	17	2	0
9	0	0	1	1
Restrictiveness Index*	88	79	94	92

*Percentage of interchanges occurring in the four most frequently used categories.

and "Clarify" occurred in 16 percent of the interchanges, with "Question" being by far the more common of the two. Rarely did the teachers elaborate on a pupil's response (2 percent).

Insert Figure 4 about here

Insert Table 5 about here

There is not a strong relationship between type of feedback and type of cognitive demand. As inspection of Table 5 reveals, the relative rank order of feedback frequencies remains about the same for each cognitive category. The rank order correlation between use of informative feedback (categories 3 and 4) and use of higher level cognitive demands (categories 5-9) is .44 (not significant at the .05 level). Apparently these teachers were just about as likely to use a given type of feedback regardless of the level of cognitive demand.

Examination of the profiles of feedback frequencies for individual teachers (Figure 4) reveals stylistic idiosyncracies (just as in the case of cognitive demands). One teacher (#7) showed a heavy, almost stereotyped reliance on simple positive feedback (approximately 70 percent of all interchanges). Others show greater versatility in the sense of using more variation in feedback.

The data on frequencies of feedback types for individual pupils within each class do not reveal any marked patterning that would suggest that some pupils are favored with any particular kind of feedback. Rather, the overwhelming influence of the uneven distribution of interchanges among pupils simply means that some children receive a disproportionately large share of all kinds of teacher feedback just because they receive more teacher communication in general.

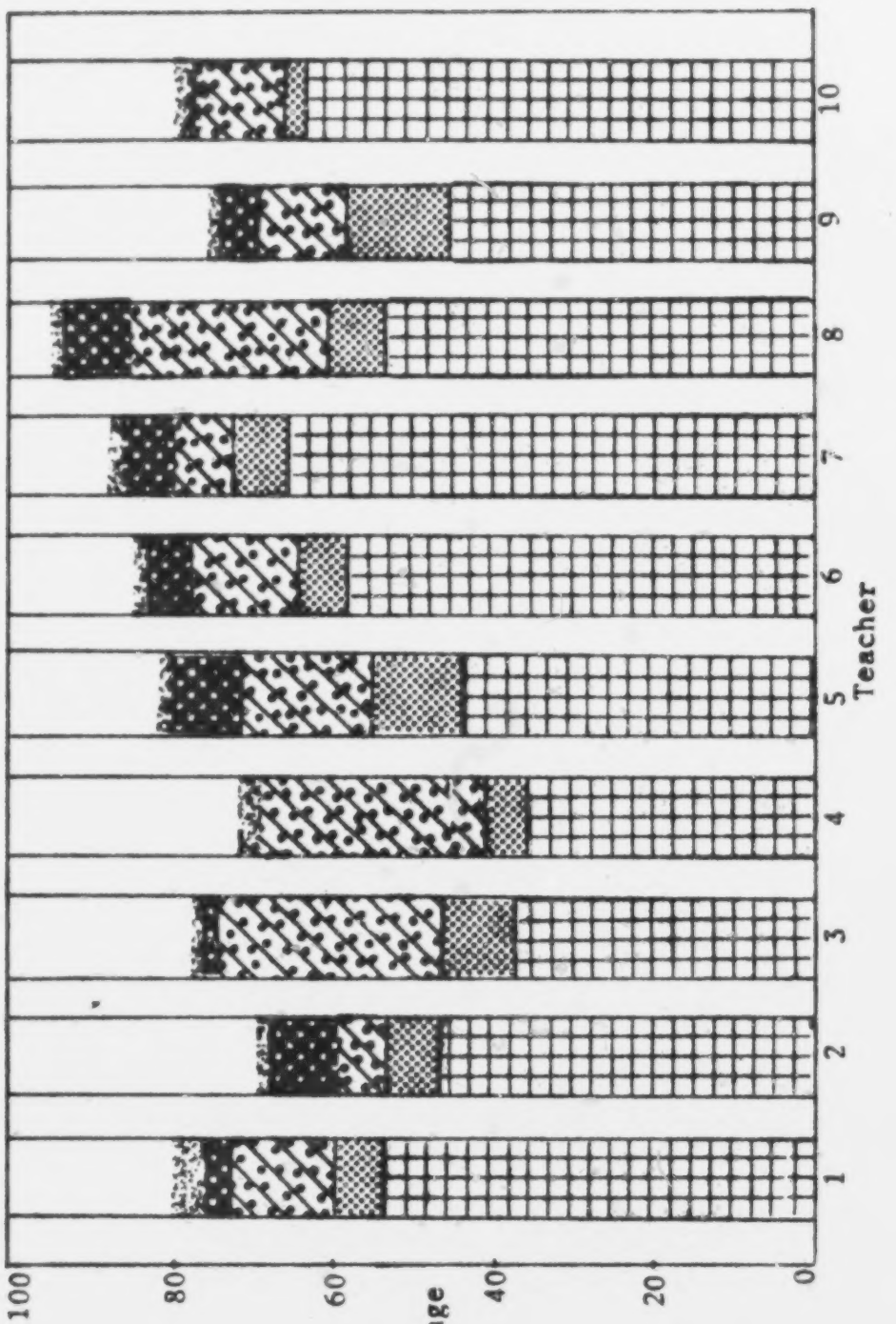

Fig. 4 Distribution of Feedback across 10 Teachers

Table 5

Distribution of Teacher Feedback According
To Cognitive Demand Categories

Feedback Categories		Cognitive Demand Categories (Percent of Total Feedback for Each Category)								
		1. Routine Respond	2. Discriminate Observe	3. Chain	4. Inform	5. Explain	6. Classify	7. Infer	8. Evaluate	9. Problem Solving
		1*	18*	18*	35*	4*	11*	4*	3*	6*
1. Positive	47*	47	48	41	50	49	48	54	38	44
2. Negative	9*	6	20	3	8	8	11	11	11	13
3. Question	14*	3	14	14	14	15	15	13	22	15
4. Clarify	2*	2	1	1	2	5	3	5	3	2
5. Praise	4*	11	4	8	3	2	5	2	3	6
6. Chide	1*	2	1	2	2	1	1	1	0	1
7. No Fb.	22*	26	23	32	20	20	17	13	23	19

* Total percent of occurrence

Summary and Discussion.

The data reported here are an attempt to describe the daily instructional communication with individual pupils of a sample of teachers of classes for the so-called educable mentally retarded. These teachers showed marked variations in (1) the amount of time during the school day they devoted to instruction, (2) the frequency with which they interacted with individual pupils per unit of instructional time, (3) the extent to which they vary the cognitive levels of their instructional communication with individual pupils, (4) the amount of instructional time devoted to various curriculum areas, and (5) the kinds of feedback given to pupil responses. The probability that a given child will engage in any amount or kind of cognitive activity under the personal direction of the teacher appears to be a function of the rate at which the teacher characteristically interacts with pupils, the variance of the distribution of interchanges across the individuals in the class, and possibly, the area of the curriculum being taught. Of these, the rate and distribution of features of the teachers' style were so strong that it was difficult to tease out evidence of other factors. The data are of such a nature that beyond these generalizations little more can be said concerning the sample as a group. The idiosyncratic patterns of each teacher's distribution of cognitive demands among pupils, combinations of types of cognitive demands, and patterns of feedback, with variation of these across curriculum areas suggests the need for great caution in generalizing about teachers and methods.

While the data are not included in this report, it should be added that the patterns of teacher behavior toward individuals reported here, which constituted dependent measures for a larger study, are not accounted for by pupil WISC IQ, self-concept and sociometric measures, or by several measures of teachers' perceptions of and attitudes toward their pupils.

Detailed descriptive data such as these raise more questions than they answer. They are presented primarily because of the questions they raise about (1) the meaning of individualization of instruction, (2) the roles teachers play in the direction of learning, and (3) the grounds on which teacher actions and decisions are made.

The classes constituting the sample in this study are the epitome of heterogeneity. Sixteen children ranging in chronological age from 9 to 13 and mental age from 5 to 11 with every sort of behavioral and learning disability imaginable have been placed into each of these special classes, presumably so that they can receive more individual attention. Teachers of these kinds of classes in theory have a number of strategies they can follow to individualize instruction. For example, they may individually assign children to different materials on which the child may work at his own pace. The fact of the matter is that in the classes studied here, as in most similar classes elsewhere, the materials simply do not exist on which to base even a small proportion of the school day on real self instruction (not to be confused with routine "seatwork"). Other commonly recommended techniques for individualization seem no more feasible. The teacher remains the main instrument for individualization. The stylistic patterns described here are, in the opinion of the authors, the manifestations of the long familiar ways in which teachers get their pupils to attend and respond to instructional material. Asking questions, demonstrating, pointing out and then responding in turn to pupil responses are the "stock in trade" of the teacher. But can it be said that the different opportunities provided different children described here represent deliberate adjustments to individual levels of readiness and need? The authors have no evidence that they do. One suspects rather that these

different patterns reflect a complex of situational and reinforcement variables in the teacher's history of learning to survive in the classroom.

Do students who receive a larger frequency of individually focussed teacher communication learn more than those who do not? Is there a relationship between the kinds of cognitive activity the teacher seems to try to stimulate and the kinds of cognitive learning that occur? Does the teacher perform an important role in reinforcing responses as learning proceeds? Of course this study provides no evidence. To our knowledge the evidence is sparse. If we continue to believe that the teacher is a direct instrumentality for pupil learning, then there is a serious need to study these questions. We are reminded of Stolurow's admonition to "master the teaching model" (and not "model the master teacher"). The instructional behaviors observed in this study did not resemble any teaching model currently espoused.

It is all too easy to translate empirical analyses of teaching into criticisms of teachers. This is unfortunate. The patterns of behavior found in these classes emphasizes the need to study the bases on which teachers make decisions about how to relate to different individuals. We know very little about the informational cues needed by a teacher to shift from one pupil to another in a way that is guided by a deliberate strategy. We know very little about the information needed by the teacher on which to base decisions about the appropriateness of different cognitive demands. Treatments of instructional methods are largely devoid of guidelines by which the teacher can relate the kinds of communications studied here to content and objectives of the principal areas of the curriculum. The results of this study have prompted the authors to move more vigorously in these directions.